DOCUMENT RESUME

ED 358 324 CE 063 873

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TITLE Beyond the Standard Employment Relationship: The Character and Determinants of Risk-Involved Teams, Altered-Time Arrangements, and the Contracting-In of Retirees. EQW Working Papers.
INSTITUTION National Center on the Educational Quality of the Workforce, Philadelphia, PA.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 93
CONTRACT R117Q00011-91
NOTE 28p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Consultants; *Employer Employee Relationship; *Employment Practices; *Flexible Working Hours; *Human Resources; Job Sharing; *Labor Utilization; Participative Decision Making; Part Time Employment; Personnel Policy; Retirement; Risk; Teamwork

ABSTRACT

A study examined three human resource arrangements that varied from the standard form of the employment relationship. One arrangement included risk-involved teams (RITs) in which greater reliance was placed on risk sharing and employee involvement. The second represented the "contracting-in" of retired employees (CIR) to act as independent consultants. The third arrangement represented altering the dimension of time spent in the workplace, or altered-time arrangements (ATAs). Explanations for the use of the three arrangements were hypothesized, and usable data were collected from 496 organizations throughout the United States. Parallel regression models were estimated to examine the pattern of coefficients across the three dependent variables: RITs, ATAs, and CIR. Findings indicated that manufacturing was behind services and other sectors in the use of ATAs but led the way in use of RITs. Regionally, the West led in use of ATAs and RITs. When the largest percentage of a firm's work force consisted of new entrants, it made more use of ATAs. Organization size was positively associated with RITs, ATAs, and CIR. When organizations had more female employees, they made more use of ATAs. When organizations had a greater number of older workers, they relied more frequently on CIR. RITs were used significantly less in organizations with a greater percentage of minorities in the work force. RITs appeared to be part of the implementation of a firm's business strategy. (Contains 60 references.) (YLB)

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Beyond the Standard Employment Relationship: The Character and Determinants of Risk-Involved Teams, Altered-Time Arrangements, and the Contracting-In of Retirees

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CE063873

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EQW Catalog Number: WP10

The work reported herein was supported under the Education Research and Development Center program, agreement number R117Q00011-91, CFDA 84.117Q, as administered by the Office of Educational Research and Improvement, U.S. Department of Education. The findings and opinions expressed in this report do not reflect the position or policies of the Office of Educational Research and Improvement or the U.S. Department of Education.

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Preface

One of the more important and hotly debated issues on the employment and education scene is the extent to which the organization of work is changing. Many believe, particularly for production jobs, that the traditional employment systems associated with scientific management—narrow, assembly line jobs with little autonomy, close supervision, and low skills—are being replaced with new arrangements that are collectively referred to as "high performance work."

These arrangements include increased employee empowerment and autonomy in decision making, work and decisions organized around teams, broader and higher skills that demand additional training, and supporting personnel practices such as variable compensation and job security. For employees, high performance work appears to improve the quality of their working life, and for organizations it may dramatically reduce costs, improve quality, and enhance overall competitiveness. These benefits may be sufficient reasons for public policy to be interested in high performance work systems and how they can be encouraged. Education policy has a special interest in this area, since these work systems appear to make new demands on workers and, in turn, on the education and training systems that provide their skills.

Peter Sherer's paper examines the conditions that determine why some employers develop high performance working arrangements while others do not. In particular, he finds that higher investment in employee training appears to be a necessary condition for developing the team work and other arrangements identified with high performance work. He also finds that the demographic characteristics of an employer's workforce affect the extent to which these work systems are introduced. Knowing what factors determine the use of high performance work helps to fashion an understanding of how policy decisions could encourage and support it.

This paper is one in a series of EQW research into the changing nature of employment and its relationships with education and training policies.

Peter Cappelli
EQW Co-Director

I. Introduction

The standard or modal employment relationship can be defined by the following attributes: the presence of an authority figure who exercises hierarchical control over employees on how and what work will be accomplished; the guarantee of a steady salary or wage; and the expectation that an employee will work year-round on a fixed, full-time (35 hours or more per week) schedule. This kind of employment relationship has dominated our image of human resources since the era of World War II. However, several observers suggest that its dominance may be fading as a number of alternative work practices and arrangements—many a result of the business and human resource restructuring that took place in the 1980s—have taken hold (Abraham 1990; Doeringer and Associates 1991; Kanter 1989; Kochan, Katz, and McKersie 1986; Lohr 1992; Pfeffer and Baron 1988; Uchitelle 1992).

In this analysis, we examine three human resource (HR) arrangements that vary from the standard form of the employment relationship. One arrangement involves teams in which greater reliance is placed on risk sharing and employee involvement. These mechanisms allow for horizontal coordination rather than hierarchical control (Aoki 1990). The second represents the "contracting-in" of retired employees to act as independent consultants. Organizations have market control over these contractors, since they have the right to determine if the consultant's performance meets specifications and to decide whether to purchase their services. However, organizations do not have as much hierarchical control over how these contractors accomplish work as they would with a standard employee (Klein and Coffee 1988; Steffen 1977). Thus, contracting-in represents an arrangement that is intermediate to market and hierarchical control. The third arrangement represents altering the dimension of time spent in the workplace. Particularly since the 1960s, practices have arisen that challenge the way in which time is arranged in the employment relationship (Pierce, Newstrom, Dunham, and Barber 1989). Work-time has been altered in terms of the work-year, number of workdays and work-hours, and the party who has control over scheduling.

Most studies that examine these arrangements look within a single organization and either seek to determine what qualities of individuals and jobs facilitate the adoption of a single arrangement or seek to determine what effect an arrangement has on attitudes and behaviors (Goodale and Aagaard 1975; Hatcher and Ross 1989; Orpin 1981; Ronen and Primps 1981). Only a few empirical studies have examined determinants of any of these arrangements across organizations (Abraham 1990; Jackson, Schuler, and Rivero 1989).

In response to this lack of data, we examined determinants of these three HR arrangements across organizations. We drew on literature from organizational demography and the economics of discrimination, business strategy, and organizational capabilities, and internal labor markets (ILMs). Organizational demography and discrimination theory suggest demographics have compositional or distributional effects that can influence what HR arrangements an organization utilizes. Some of the arrangements that organizations use to deal with demography contribute to allocative

efficiency, while others reflect the distribution of power and discrimination in organizations. Business strategy and organizational capabilities literature suggests that HR arrangements are used to mobilize employee assets to develop organizational capabilities and generate revenues. ILM literature suggests that training, career ladders, and other elements of ILMs are efforts to promote organization-specific skill acquisition and to provide incentives for employees. If the three HR arrangements require organization-specific skills and incentives to succeed, ILMs will be positively related to them. ILMs and the three arrangements might also be positively related as part of a more general organizational effort to gain legitimacy and appear innovative. Contrarily, other arguments about ILMs suggest that, as institutionalized practices or customs, they will impede the alteration of standard employment relationships.

For this analysis, we will first identify more fully the three HR arrangements and then address theoretical explanations for their use and generate hypotheses. Subsequently, the hypotheses will be tested on a large data set of organizations (N=496) from a survey conducted by Towers Perrin, a major human resource consulting firm. Finally, we will present the results and conclude by examining implications of the findings for the study and practice of human resources.

II. Beyond the Standard Employment Relationship: The Character of RITs, CIRs, and ATAs

In the standard or modal employment relationship, an organization provides employees with the larger portion of their compensation as a guaranteed salary or wage—a fixed claim. In return, the employer has the legal right to control over employees (Klein and Coffee 1988; Steffen 1977). As Simon (1951) suggests, the employer purchases, and thus has authority over, an employee's services within an admissible set. The employer consequently has the right to monitor, train, and supervise the employee in what to do and how to do it. A key and related property of this standard employment relationship is that employees receive continuity or regularity in their employment. In return, employers expect employees to work continuously or regularly—usually by a fixed, full-time, and full-year schedule.

The standard or modal employment relationship involves several fundamental principles. One precept in this arrangement is that risk is traded off with control; in other words, the party that takes the risks gives the orders (Klein and Coffee 1988). The second is that control is better handled inside the firm through hierarchical control (i.e., the authority relationship), rather than horizontally through teams or the external market. The third principle is that employees receive continuity or regularity in employment when they provide their labor on a fixed and typically full-time basis.

One way, therefore, to vary the standard employment relationship is by internally shifting risks and, hence, control. Through gain sharing, profit sharing, incentive plans, and similar arrangements, employers shift risk to the

employees. Since risk begets control (Klein and Coffee 1988), employees can be expected to have more control when they receive pay-at-risk.

As Aoki (1990) suggests, when employees have more control they are no longer managed in the H-mode (Hierarchical mode) but instead are managed in the J-mode (Japanese mode). The H-mode is the standard or modal employment relationship involving the use of a centralized authority or superior who tells subalterns how to perform activities. The J-mode involves horizontal coordination through self-managed teams. Such teams utilize social conditioning or attitude shaping (Williamson 1985) in order to maintain loyalty, spirit, and coordination within the team (Alchain and Demsetz 1972). The net result of this shift in risk-control is what we refer to as risk-involved teams (RITs).

A second way to vary from the standard employment relationship is by externalizing hierarchical or administrative control (Pfeffer and Baron 1988). While organizations contract with many different forms of labor, they "contract-in" with former employees who are retired. Retirees move from being employees to being contract consultants, who are not legally employees but rather are independent contractors; by legal definition, organizations do not exercise hierarchical control over them. Firms do exercise market control in the form of purchasing or not purchasing the contractor's services (Klein and Coffee 1988; Morris 1983; Steffen 1977). However, given that these consultants have been employees in the same organization, the relationship between the parties is not that of a market transaction alone. We can safely conclude that control is intermediate to the market and hierarchy, and that is why we refer to this arrangement as "contracting-in."

A third way of modifying the standard employment relationship is by altering work-time. In the standard employment relationship, an individual works five days per week, for a total of 35 or more hours (typically 40) on a full-year basis. One alternative to this time schedule keeps the hours of work the same, but compresses the work-week, making it more flexible. Compressed weeks, such as the four day/forty hour schedule (4/40), involve a fixed yet shortened work-week (Pierce et al. 1989). Another option, flextime, involves employers setting a core or band of hours when employees are required to be at work and giving employees discretion to schedule the remaining work-hours (Pierce et al. 1989). Other alternatives result in a reduction of work-hours or work-days. The most common are part-time work and job sharing arrangements between two or more individuals (Pierce et al. 1989; Tilly 1991). Another variant is to alter the notion of year-round work by establishing part-year work. Altogether, these practices represent what we refer to as altered-time arrangements (ATAs).

We use the term ATAs, rather than flexible-time arrangements, because these arrangements may not provide flexibility. Pfeffer and Baron (1988) rightly suggest that some of these practices may result in less flexibility for employees, and it also may be the case that some of these practices result in less flexibility for employers. Employers may enact these time practices to accommodate employees rather than to experience any real gains in their flexibility. What these practices do have in common and what they do more fundamentally is to alter the conception, specification, and fixing of time in the standard employment relationship.

III. The Determinants: Organizational Demographics and Discrimination, Business Strategy and Capabilities, and ILMs

In this segment, we will identify explanations for the three arrangements described above. In relation to organizational demographics (Pfeffer 1983), a key labor market shift has occurred through the rise in the female labor force participation rate (LFPR) in the Post World War II era. In 1950, the rate for female participation in the workforce was 34 percent. By the beginning of the 1990s, the overall rate had approached 60 percent, and roughly 70 percent of the women between the ages of 20-34 participated in the labor market (U.S. Bureau of Labor Statistics 1991).

Given these labor market trends, at least given the numbers, it is obvious that women now have greater importance in the labor market and within organizations. Moreover, women often have substantial human capital, especially in their educational attainment (Blau and Ferber 1986). The use of ATAs appears to be an effective means for attracting and maintaining a female labor supply in a time of skill shortages, since many women have family responsibilities that preclude them from working a standard work schedule. Tilly (1991), for example, argues that voluntary part-time arrangements are aimed at retaining or attracting employees, especially women with children; roughly one-fifth of jobs held by females are part-time (U.S. Bureau of Labor Statistics 1991).

Once a significant proportion of an organization's workforce is female, we might expect the distribution of influence and power to be cast more in favor of women. Women would thus be granted a greater voice in and more effective advocacy for such arrangements. Consequently, for reasons of allocative efficiency and influence, we hypothesize:

H1: The percent female of a workforce will be positively associated with the use of ATAs in organizations.

Another major shift in the workplace has been the aging of the labor force. The average age of the labor force in much of the Post World War II era was in the low- to mid-30s. Due to the prolonging of life and the decline in the birth rate (Fosler, Alonso, Meyer, and Kern 1990; Johnston and Packard 1987), the average age is now approaching 40 years (Johnston and Packard 1987). Given the improvement in the health of senior workers through the years, their willingness to work, and the increasing use of early retirement plans, organizations are making use of retirees in a different capacity.

A number of major organizations, including Kodak and IBM, are known to bring back former retirees as consultants. Making use of these older employees' skills, often in the face of skill shortages, is a way of gaining access to firm-specific skills that would otherwise be both costly and perhaps difficult to develop internally or to purchase from outside consultants. Alternatively, the contracting-in of these retirees may be viewed as a "golden" retirement package (the parallel to a golden parachute), in which a coalition

of older employees influences organizations to back-end entitlements that promise their return under very casual terms. Therefore, if there is an older workforce, the use of these arrangements may signify allocative efficiency or may reflect the politics of numbers. Either way we can hypothesize:

H2: An older workforce will be positively associated with the contracting-in of retirees.

This hypothesis more simply relies on an existing, greater supply of older workers that can be contracted-in as retirees.

The final demographic shift is the rise in minority representation in the labor force. While minorities constituted about 15 percent of the labor force in the early- to mid-1980s, they will account for a larger percentage of the new entrants into the labor force by 2000 (Johnston and Packard 1987). Minorities often possess less human capital than nonminorities, due to poorer schooling and less on-the-job training (e.g., Blau and Kahn Forthcoming; Johnston and Packard 1987). Employers may also engage in statistical discrimination by perceiving minorities to be less productive on average or more variable in their productivity than nonminorities (Aigner and Cain 1977). For these reasons, employers may make greater use of hierarchical control with minority workers.

In addition, the economic model of employee discrimination predicts that if nonminority (i.e., white) employees have negative and discriminatory "tastes" for working or being in contact with minorities (Becker 1957), or if they have a positive preference for working with other nonminorities (Goldberg 1982), then teams will not be used as a form of organization as frequently. Teams typically require the mixing of minorities and nonminorities. As a result, white employees with discriminatory tastes or positive preferences for nonminorities may require a pecuniary premium for working in heterogeneous teams. If this is so, heterogeneous teams are more costly for the employer to run than homogeneous teams. Moreover, if there are discriminatory preferences, placing nonminorities and minorities together in heterogeneous teams may increase the potential for conflict. Thus, for reasons of human capital, statistical discrimination, and employee discrimination, we hypothesize:

H3: The percent minority of the workforce will be negatively associated with the use of RITs.

We also might hypothesize that women face discrimination that is similar to the discrimination experienced by minorities. Thus, we would expect RITs to be negatively related to the percent female in a workforce. However, occupational segregation by gender far exceeds that by race (Blau and Ferber 1986) and thus there is less potential for men and women to be mixed in teams in which there is horizontal control. Therefore, even if male employees discriminate against female employees, the use of teams will not be an arena where these discriminatory preferences are played out, and the percent female of a firm will not be associated with the use of teams.

A second set of explanations relates to changes in business strategies. Many organizations are actively engaged in shifting their business portfolios by eliminating lines of businesses and markets. This shift allows the firm to focus on what it does particularly well, or its distinctive competence (Selznick 1957; Snow and Hrebreniak 1980), and to develop a central capability or complimentary set of capabilities—a core competency (Prahalad and Hamel 1990). In order to implement such a shift, organizations have to mobilize their assets (Itami 1987).

A way in which organizations can focus their human assets by mobilizing them is through RITs. Evidence that RITs have such mobilizing effects comes from several sources. Cole (1983) argues that Japanese small-group

participative structures (*shoshudanshugi*) contributed to the mobilization of Japanese human resources in order to deal with competition. In the U.S., Kochan, Katz, and McKersie (1986) refer to high or mutual commitment employment systems, and Lawler (1986) refers to high involvement systems as ways in which firms have motivated workers toward a common objective. Among other things, these systems involve teams, contingent compensation, and highly involved workers. Jackson et al. (1989) found that organizations which engaged in a great deal of innovation were likely to offer pay-at-risk and employment security and to have supervisors less actively involved in monitoring employees. Therefore, we hypothesize that:

H4: Organizations that are shifting their business portfolio will make more use of RITs.

The relationship between shifting the business portfolio and the contracting-in of retirees is unclear. When continuity in knowledge is important, organizations can make use of retirees. However, when there is a shift in the business portfolio, the prior stock of knowledge may no longer be as valuable, and there will be little use for bringing back retirees as consultants.

Another aspect of business strategy involves technological change in organizations. One effect of technological change is to allow organizations to make greater use of RITs—in these cases, technology takes the place of direct supervision and monitoring. Technological changes may also be an indicator that an organization has higher technological specificity (Pfeffer and Cohen 1984), although the obverse argument is certainly possible (Jacoby 1990). Organizations facing considerable technological change and, hence, uncertainty may also require employees to work in teams so that they can continuously share information (Aoki 1990). A second effect of technological change is to deter the contracting-in of former employees. With technological change, the knowledge of former employees no longer has continuity; valued organization-specific human capital loses its value. Finally, the effect of technological change on ATAs is ambiguous. Technological change may free employees' time and make ATAs more possible, but it may require more fixed work schedules in order to operate new machinery. The above points lead us to hypothesize:

H5: Technological change will be positively associated with RITs and negatively associated with the contracting-in of retirees.

A third set of explanatory factors has to do with ILMs—administrative units within organizations in which the pricing and allocation of labor is done through internal rules and procedures (Doeringer and Piore 1971). Organizations with fully developed ILMs typically have more firm-specific or idiosyncratic skill requirements (Pfeffer and Cohen 1984; Williamson, Wachter, and Harris 1975). Such skills are embodied in teams, especially when work becomes complex (Rumelt 1988; Williamson 1985). Moreover, when there is an ILM, many elements of control become part of organizational routines (Winter and Nelson 1982) or are embedded in organization rules. Thus, they do not have to be expressed through hierarchical control (Pfeffer 1983).

In addition, as an index or fixed effect of the ways in which organizations approach human resources, firms with fully developed ILMs may make more use of the three arrangements discussed above. Such organizations may have adopted ILMs for organizational legitimacy (Pfeffer and Cohen 1984) because of bandwagoning, a founder's imprint, or an organizational culture (Baron, Jennings, and Dobin 1986). These organizations may adopt the three HR arrangements for the same or similar reasons.

On the other hand, ILMs may pose a barrier to using each of the three HR arrangements. ILMs represent institutionalized practices or customs that refer to the standard employment relationship. Doeringer and Piore (1971) suggest that a defining quality of ILMs is the extent to which the rules are rigid or internalized. More rigid or internalized rules may mean that an organization is less willing to respond to change and is consequently less willing to use the three arrangements, which typically are alternatives to the status quo.

We specify hypotheses about ILMs with several variables; one is the average cost to train new hires. Organizations with higher training costs may have more organization-specific knowledge requirements (Pfeffer and Cohen 1984). A portion of these training costs can be attributed to the socialization of employees. Organizations that perform more socializing or "cultural control" (Ouchi 1980) presumably are better at transmitting their values to employees. They therefore have less need for hierarchical control, particularly with their more senior employees (Pfeffer 1983).

The contracting-in of retirees allows organizations to gain access to existing firm-specific knowledge. Indeed, when training costs are high, contracting-in may be a relatively low-cost solution for acquiring skills. Similarly, ATAs may be a way for organizations to retain and dedicate their human capital investments. These points lead us to hypothesize:

H6: Organizations with higher annual costs to train new employees make more use of ATAs, RITs, and the contracting-in of retirees.

Another critical element in ILMs is the degree to which there are formal career ladders (Althauser and Kalleberg 1981; Doeringer and Piore 1971; Pfeffer and Cohen 1983). Career ladders may be critical for the establishment and ultimate success of RITs (Aoki 1990). One part of this argument concerns the skills and knowledge needed to make teams valuable and able to operate successfully. Career ladders are associated with the acquisition of firm-specific skills. Employees with greater firm-specific skills may need less hierarchical supervision because they know what to do and how to do it—perhaps better than their supervisors or anyone else in the organization.

A second and consistent argument speaks more to the incentive qualities of career ladders. Because it is often difficult to reward employees through any one payment period or through an annual raise, career ladders provide a means to settle up ex post (Williamson et al. 1975). Teams particularly require ex post settling up because of the difficulty in metering or assessing individual marginal products at any one point in time (Williamson 1985). Due to the incentive effects of career ladders, employees in teams may put forth effort instead of seeking free-rider effects (Aoki 1990). The incentive effects of promotions may be heightened in organizations with teams. While career ladder plans made job movements almost a certainty for employees (Doeringer and Piore 1971; Piore and Sabel 1984), teams flatten organizations and chop steps out of ladders, making for a much quicker and steeper climb up the ladder. As a result, the career ladder may have the character of a rank-order tournament—implying that any drop along the way is very critical—thus giving it more incentive value (Aoki 1990).

Career ladders are expected to be negatively related to the contracting-in of retirees. Organizations with career ladders make an implicit contract or "promise" to employees that access to the ladder is for those inside the firm and cannot be gained from outside of the organization—even with former insiders. CIRs would thus be a breach of this implicit contract. Thus, we hypothesize:

H7: Organizations with career ladders make more use of ATAs and RITs, but they make less use of the contracting-in of retirees.

A final element of ILMs involves turnover rates for new employees. The cross-sectional effects of first-year turnover on ATAs are unclear. We could hypothesize that organizations with higher turnover rates use ATAs to reduce turnover. Thus, we would expect a positive relationship between turnover rates and the use of ATAs. However, if ATAs have their hypothesized effect of reducing turnover, we would expect turnover rates to be negatively related to them. There is a similar causal ambiguity in the relationship between turnover rates and RITs. Firms may adopt RITs to reduce turnover; on the other hand, if RITs had this effect, we would observe low turnover rates for firms with that method of organization. Finally, the relationship between turnover rates and contracting-in is similarly unclear. If organizations have high turnover rates, they may not have many former employees to contract-in and may have little in the way of firm-specific skill requirements. Conversely, organizations with high turnover rates may have a stronger demand for the services of the few former employees who truly have firm-specific knowledge. We, therefore, do not propose a hypothesis for the turnover rate.

We also examine several control variables, several of which are worth noting. First, we control for the number of entry-level hires, defined as Ln(ENTRY). This variable is largely a measure of organizational growth in employment and presumably the more general growth of the organization. It also captures elements of an internal labor market. Organizations that make extensive use of entry-level positions for hiring, as opposed to offering a larger number of laterals, typically have a more fully developed internal labor market.

We also control for organization size in terms of full-time employees, defined as the Ln(FULLTIME). In prior studies, size has had mixed effects. Abraham (1990) found that size positively affected the use of alternative work arrangements; in the Kochan et al (1986) study of high commitment employment, many of the organizations were quite large and highly visible. However, Jackson et al. (1989) found no effect for size on a number of employment practices, such as the use of incentive plans.

Despite these mixed results for size, we expect it to be positively related to the use of ATAs, RITs, and the contracting-in of retirees. Size allows for scale effects, so that larger organizations may be more able to provide these alternatives at a lower unit cost. Size provides something of a scope effect as well. Large organizations have more latitude to use different policies because they have more room to experiment with departments, plants, or divisions. Finally, size makes organizations more visible, and when concerned with legitimacy they may adopt arrangements such as ATAs and RITs (Pfeffer and Cohen 1984).

We control for industry by using a one-digit SIC code. Compared with organizations in manufacturing, we expect those in services, retail trade, and the finance, insurance, and real estate (hereafter referred to as "finance") sectors to use ATAs the most because in these industries the technology is less fixed. RITs aid organizations in restructuring, so we therefore expect to find more of them in industries that have been restructured. In 1990, when the data were collected, manufacturing had undergone business and human resource restructuring; other sectors, particularly the services and financial sectors, lagged. We consequently expect manufacturing to make the most use of RITs. We also expect that manufacturing would contract-in retirees more frequently because restructuring reduces employment among senior employees.

IV. Method

Respondents

Towers Perrin, a major human resource consulting organization, and the Hudson Institute conducted a survey in 1990 that was sent to almost 3,000 organizations in the U.S. The objective of the survey was to address changes in the organizational demographics of human resources, assess the status of specific human resource practices in organizations, and identify some of the changes in the business strategy of organizations. Responses were received from 853 organizations, resulting in a response rate of approximately 28 percent. A number of organizations did not fully answer questions about their internal demographics, industry, occupational mix, and size. Since these variables served as controls, organizations that submitted surveys with missing data were omitted from the analyses, and our final sample was 496.[1] Our average organization had approximately 7,000 employees, making our sample weighted toward larger organizations.

Measures

Data for the control variables came from organizational responses to survey questions on the number of full-time employees, number of entry-level hires, occupational mix, primary industry, and primary geographic location. Organizations also provided the percentage of their workforce over the age of 40 and the percentage of their female workforce. In addition, organizations indicated the percentage of their minority workforce by checking one of several percentage categories: 0-2 percent; 3-5 percent; 6-10 percent; 11-20 percent; 21-25 percent; 26 percent or more. We coded the midpoint for each of these intervals and capped the highest category at 35 percent. Information disclosed also included the first-year turnover rate for entry-level hires as a percentage. Training costs were assessed as the annual cost of training (classroom and on-the-job) for the average entry-level hire, divided into four categories: 0-$999; $1,000-$1,999; $2,000-$5000; over $5,000. We coded the midpoint for each of these categories and capped the highest category at $7,500. Technological change was assessed through a question asking if the organization had increased its use of technology/automation/capital investment. We assessed shifting the portfolio through a question asking if the organization had eliminated markets or lines of business. For technological change and shifting the portfolio, we coded yes as "one" and no as "zero." We assessed career ladders by asking whether organizations had no career ladders, had career ladders for managers and supervisors, or had career ladders for all employees. We coded no as "zero," yes for managers and supervisors as "one," and yes for all employees as "two."

Organizations responded to a series of questions on a zero-to-three scale about the different practices that comprised the three dependent variables: risk involved teams (RIT), altered time arrangements (ATAs), and the contracting-in of retirees (CIRs). Responses were coded as "zero" if a firm did not have the practice, as "one" if there

[1] A comparison of mean values between the larger and final samples on variables used in the analyses indicated that these samples were quite similar.

were trial programs, or as "two" if there were pilot programs. Finally, responses were coded as "three" if a firm had a full-scale program.

We used 15 survey items on human resource practices in order to assess the status of RITs, ATAs, and CIRs. We first analyzed the 15 practices with principal components analysis. As we expected, a scree test of the eigen values showed an "elbow" or break in the values at three factors. After three factors, the eigen values dropped dramatically, indicating that there are three major factors. We then did a varimax rotation of the factors in order to improve their interpretability.[2] We developed composite scores for the three dependent variables based on unit weightings of items that loaded highest on each factor. The mean values and standard deviations for the composite scores and the control and independent variables are shown in Table 1.

Analytic Procedure

We estimated parallel regression models to examine the pattern of coefficients across the three dependent variables. The estimating equations for the three dependent variables are:

(1) $RIT_i = A + B\,DEM_i + C\,STRAT_i + D\,HLM_i + E\,CONTROL_i + e_i$,

(2) $ATA_i = P + Q\,DEM_i + R\,STRAT_i + S\,HLM_i + T\,CONTROL_i + f_i$,

(3) $CIR_i = U + V\,DEM_i + X\,STRAT_i + Y\,HLM_i + Z\,CONTROL_i + g_i$;

Where,

RIT, ATA, and CIR are each vectors of observations for the dependent variables;

DEM is a matrix of observations for organizational demography variables;

STRAT is a matrix of observations for business strategy variables;

HLM is a matrix of observations for HLM variables;

CONTROL is a matrix of control variables for industry, region, occupational distribution in organizations, full-time employment, and entry-level employment;

A through E, P through T, and U through Z = coefficient vectors;

and, e, f, and g are error terms or vectors of residuals.

V. Results

The eigen values, the factor loadings and resultant dimensions (the loadings for a factor are underscored), and the communality estimates are shown in Table 2. The three factor solutions reflect the three HR arrangements. For each factor, most of the loadings are high, and none of the cross loadings exceed .20. Thus, the pattern of high loadings and low cross loadings provide a strong approximation to simple structure.

The factor loadings indicate that the bundles of practices are to be viewed as dimensions that represent more than each practice taken singularly. The loadings on the first factor represent the RIT dimension and relate to the use of contingent or risk-based compensation, self-managed and involvement teams, and organizational support. The loadings on the second factor comprise the ATA dimension. The specific practices that load highly on this factor are part-year, part-time, job sharing, flextime, and compressed work arrangements. The loadings on the third factor comprise the dimension for CIRs and reflect the use of retirees as consultants on special projects or in pools. We included as a "tracer" variable an additional item in this factor that

[2] With this model specification, we also ran a LISREL confirmatory factor analysis. The chi-square value in LISREL for this model specification confirms our results.

Table 1

Means and Standard Deviations for

Independent and Dependent Variables

	Mean	S.D.
Controls:		
Agric	.006	
Const	.004	
Finance	.198	
Mining	.014	
Services	.236	
Trade	.054	
Transp	.101	
Others	.151	
Manufacturing	.236	
% Supervisory/ Administrative	18.702	13.722
% Sales	6.775	14.021
% Professional	18.891	19.807
% Technical	9.540	11.667
% Skilled Crafts	10.334	16.133
% Secretarial/Clerical	17.674	17.551
West	.230	
Midwest	.470	
South	.284	
Northeast	.016	

	Mean	S.D.
Ln(ENTRY)	4.587	2.233
Ln(FULLTIME)	7.208	1.923
Demographics:		
% Workforce over 40	36.089	14.789
% Workforce Minorities	15.252	11.915
% Workforce Female	44.736	22.386
Business Strategy:		
Shift Business Portfolio	.067	.249
Technological Change	.496	.500
ILMs:		
First-Year Turnover	25.960	37.622
Training Costs for New Hire	$1,764.	$ 1,739.
Formal Career Ladders	.716	.861
Dependent Variables:		
ATAs	4.135	3.804
RITs	2.817	2.729
CIRs	2.310	2.798

Table 2

Factor Analysis of ATAs, RITs, AND CIRs:

Rotated Factor Matrix (Loadings and

Cross Loadings), Communality Values, Eigen Values

	FACTOR 1	FACTOR 2	FACTOR 3	COMMUNALITY
Flexitime	.54147	.20640	.16081	.36165
Job Sharing	.60917	.09780	.15791	.40559
Compressed Workweek	.60298	.17812	-.10250	.40582
Part-Year Work	.40945	-.09601	.06372	.18093
Part-Time Work-Force	.71727	.05277	.04898	.51966
Part-Time Professionals	.57835	-.05284	.14943	.35962
Gain Sharing	-.00808	.65451	.11803	.44238
Self-Managed Work Groups	.01191	.63070	.14312	.41840
Employee Involvement Teams	.01733	.66093	.11888	.45127
Supportive Culture	.20493	.48933	.03120	.28241
Incentive Programs	.02406	.57976	-.01507	.33693
Retirees as Consultants	-.00653	.15959	.79757	.66164
Retirees on Projects	.11113	.08736	.75929	.59650
Retiree Job Banks	.17645	-.01542	.45246	.23609
Use of Consultants	.07610	.13518	.52255	.29712
Eignenvalue	2.91976	1.68647	1.34977	5.95600
% Variance Explained	19.5	11.2	9.0	39.7

Table 3

Parallel Regressions for RITs, ATAs, and CIRs

(N=496; Standard Errors in Parentheses)

	Dependent Variables:		
	ATAs	RITs	CIRs
Independent Variables:			
Controls:			
Agric	2.542	-2.194	.227
	(2.059)	(1.418)	(1.474)
Const	-.800	-3.341 *	1.213
	(2.504)	(1.723)	(1.792)
Finance	-.423	-2.302 ***	-1.008 **
	(.628)	(.433)	(.449)
Mining	1.141	.313	2.159 **
	(1.385)	(.954)	(.991)
Services	1.350 **	-1.569 ***	-1.275 ***
	(.635)	(.438)	(.455)
Trade	-.607	-1.639 **	-.923
	(.929)	(.640)	(.665)
Transp	.126	-1.170 ***	-.983 **
	(.617)	(.425)	(.442)
Others	.635	-.652 *	-.197
	(.541)	(.373)	(.387)
Omitted Category: Manufacturing			
West	1.239 ***	.559 **	.268
	(.396)	(.273)	(.284)
Midwest	-.321	.170	.595 **
	(.352)	(.243)	(.252)
South	-.656 *	-.001	-.467
	(.382)	(.263)	(.273)
Omitted category: Northeast			

	Dependent Variables:		
	ATAs	RITs	CIRs
% Supervisory/ Administrative	.010	.001	.006
	(.013)	(.009)	(.009)
% Sales	.006	-.014	-.008
	(.014)	(.009)	(.010)
% Professional	.002	.007	.010
	(.011)	(.008)	(.008)
% Technical	.016	-.011	.000
	(.014)	(.010)	(.010)
% Skilled Crafts	-.015	-.009	-.009
	(.012)	(.008)	(.008)
% Secretarial/ Clerical	.011	-.012	.006
	(.011)	(.008)	(.008)
Omitted Category: Other			
Ln(ENTRY)	.385 **	.043	.097
	(.149)	(.103)	(.107)
Ln(FULLTIME)	.326 **	.228 **	.375 ***
	(.159)	(.110)	(.114)

Table 3 continued

	Dependent Variables: ATAs	RITs	CIRs
Independent Variables:			
Demographics:			
% Workforce Over 40	-.002	.004	.031 ***
	(.012)	(.008)	(.009)
% Workforce Minorities	-.018	-.003	.014
	(.015)	(.011)	(.011)
% Workforce Female	.019 *	-.009	-.008
	(.010)	(.007)	(.007)
Business Strategy:			
Shift Business Portfolio	-.440	.989 **	-.179
	(.643)	(.443)	(.460)
Technological Change	.991 ***	.673 ***	.358
	(.329)	(.226)	(.235)
HLMs:			
First-Year Turnover	-.008	-.001	-.008 **
	(.005)	(.004)	(.004)
Training Costs for New Hire	.212 **	.159 **	.186 ***
	(.096)	(.066)	(.069)
Formal Career Ladders	.075	.306 **	-.082
	(.189)	(.130)	(.135)
Constant	-2.025 *	1.739 **	- 1.813 **
	(1.167)	(.804)	(.835)
R-Squared	.229	.289	.270
Adjusted R-Squared	.185	.248	.228

Key:
* = 10 % level;
** = 5% level;
*** = 1 % level
(Two Tailed Test)

Table 4

Parallel Regressions for ATAs, RITs, and CIRs with SHIFT X Ln(ENTRY)

(N=496; Standard Errors in Parentheses)

	Dependent Variables:		
	ATAs	RITs	CIRs
Independent Variables:			
Controls:			
Agric	2.544	-2.128	.294
	(2.062)	(1.416)	(1.471)
Const	-.797	-3.232 *	1.325
	2.508)	(1.722)	(1.789)
Finance	-.420	-2.190 ***	-.972 **
	(.635)	(.436)	(.453)
Mining	1.139	.252	2.095 **
	(1.388)	(.963)	(.990)
Service	1.351 **	-1.535 ***	-1.241 ***
	(.636)	(.437)	(.454)
Trade	-.608	-1.673 ***	-.958
	(.930)	(.639)	(.664)
Transp	.127	-1.161 ***	-.973 **
	(.618)	(.424)	(.441)
Others	.637	-.554	-.097
	(.547)	(.376)	(.390)
Omitted category: Manufacturing			
West	1.240 ***	.605 **	.315
	(.398)	(.273)	(.284)
Midwest	-.320	.193	.619 **
	(.353)	(.243)	(.252)
South	-.657 *	-.027	-.494 *
	(.383)	(.263)	(.273)
Omitted category: Northeast			

	Dependent Variables:		
	ATAs	RITs	CIRs
% Supervisory/ Administrative	.010	.001	.006
	(.013)	(.009)	(.009)
% Sales	.006	-.013	-.007
	(.014)	(.009)	(.010)
% Professional	.002	.008	.010
	(.011)	(.008)	(.008)
% Technical	.016	-.012	.001
	(.014)	(.010)	(.010)
% Skilled Crafts	-.015	-.009	-.009
	(.012)	(.008)	(.008)
% Secretarial/ Clerical	.011	-.014 *	.004
	(.011)	(.008)	(.008)
Omitted Category: Other			
Ln(ENTRY)	.386 **	.071	.125
	(.151)	(.104)	(.108)
Ln (FULLTIME)	.326 **	.229 **	.376 ***
	(.159)	(.109)	(.113)

Table 4 continued

	Dependent Variables:		
	ATAs	RITs	CIRs
Independent Variables:			
DEMOGRAPHICS:			
% Workforce			
Over 40	-.002	.004	.031 ***
	(.012)	(.008)	(.009)
% Workforce			
Minorities	-.018	-.003	.014
	(.015)	(.010)	(.011)
% Workforce			
Female	.019 *	-.010	-.008
	(.010)	(.007)	(.007)
Business Strategy:			
Shift Business			
Portfolio	-.395	2.712 **	-1.602
	(1.545)	(1.061)	(1.102)
Technological			
Change	.991 ***	.704 ***	.390 *
	(.330)	(.227)	(.235)
HLMs:			
First-Year			
Turnover	-.008	-.001	-.008 **
	(.005)	(.004)	(.004)
Training Costs			
for New Hire	.212 **	.161 **	.188 ***
	(.097)	(.066)	(.069)
Formal Career			
Ladders	.075	.288 **	-.100
	(.190)	(.130)	(.135)

	Dependent Variables:		
	ATAs	RITs	CIRs
Interaction:			
SHIFT X Ln(ENTRY)	-.009	-.336 *	-.347 *
	(.204)	(.188)	(.195)
Constant	-2.028 *	1.613 **	-1.943 **
	(1.172)	(.805)	(.836)
R-Squared	.229	.294	.274
Adjusted			
R-Squared	.183	.252	.231

Key:
* = 10 % level;
** = 5% level;
*** = 1 % level
(Two Tailed Test)

directly assessed whether firms used outside consultants. This item's strong loading, combined with the other loadings on this factor, attests to the use of former employees as independent contractor/consultants.[5]

The results for the parallel regressions are shown in Table 3. In the ATA equation, the industry controls indicate that services exceed manufacturing in the use of ATAs. Our regional controls indicate that the West, relative to the Northeast, makes more use of ATAs. Finally, Ln(ENTRY) and Ln(FULLTIME) are both positively related to the use of ATAs.

Our substantive hypotheses for ATAs receives some support. The percent female in the workforce is positively related to the status of ATAs, but only at the 10 percent level. Technological change is positively related to the use of ATAs. Finally, training costs are positively related to the use of ATAs, but there is no relationship for turnover or having career ladders.

There are a number of significant results for RITs, which include several significant control variables. The industry dummy variables indicate that, contrary to the findings for ATAs, manufacturing is clearly the leader in the use of RITs. Organizations in sectors like services and finance make less use of RITs. The West leads the Northeast in the use of RITs. The Ln(FULLTIME) is positively related to RITs, and the Ln(ENTRY) is not.

Our substantive hypotheses for RITs are largely supported. For business strategy, we find that shifting the business portfolio and increased technological change both relate positively to the use of RITs. For HLMs, we find that annual training costs and formal career ladders are positively associated with the use of RITs. We do not find, however, that a higher percentage of minority employees results in significantly less use of RITs.

There are also a number of significant results for the contracting-in of retirees (CIRs). The industry dummy variables indicate that mining leads manufacturing; finance, services, and transportation and public utilities, as compared with manufacturing, make less use of contracting-in. The Midwest leads the Northeast. Finally, the Ln(FULLTIME) positively relates to the use of the contracting-in of retirees, but Ln(ENTRY) does not.

Several of our substantive hypotheses for CIRs are confirmed. Having an older workforce results in greater use of these arrangements. In addition, higher training costs lead firms to use CIRs more. We also find, although no hypothesis was stated, that turnover costs are negatively related to contracting-in. However, having a career ladder plan, shifting the business portfolio, and technological change do not result in significantly less use of contracting-in.

VI. Discussion

Our findings across the three dependent variables reveal overall patterns and have a number of implications. First, manufacturing is behind services and other sectors in the use of ATAs. There may be greater fixed setup costs and other aspects of manufacturing organizations that make it more difficult for them to use ATAs. However, manufacturing leads the way in the use of RITs and are ahead of several sectors in the use of CIRs.

[5]The addition of this item did not change the regression results.

The interesting question from this latter finding is whether organizations in the services and finance sectors, which have been undergoing significant restructuring, are now restructuring their human resources in the same way that manufacturing organizations did in the late 1980s. Newspaper accounts on human resources in the services and finance sectors increasingly mention the use of teams and incentive plans (e.g., Gabor 1992), but evidence of an aggregate trend requires further study.

We find that the West leads in the use of ATAs and RITs. The population in the West is the youngest in the U.S. (U.S. Bureau of Census 1991), and they may make more demands on firms to alter work-time and to flatten and temper hierarchical control. Some of the demands on altering time may reflect family responsibilities. Part of this may also reflect sorting effects. Many people settle in California and the West in general because they prefer the lifestyle or labor/leisure choices this region offers (Pfeffer and Baron 1988). The Midwest leads in the use of the contracting-in of retirees. The result may reflect what has been arguably greater restructuring in Midwestern organizations combined with the Midwest age demographics, which place it second only to the Northeast for the size of its older population (U.S. Bureau of Census 1991).

Our only result for Ln(ENTRY) indicates that when the largest percentage of a firm's workforce consists of new entrants, it makes more use of ATAs. This result suggests that firms use ATAs as a recruiting device. In a separate analysis not shown, we found that the addition of Ln(ENTRY) moved a hitherto positive and significant coefficient for the percent secretarial/clerical toward zero. Our results for Ln(ENTRY) and percent secretarial/clerical therefore suggest that entry flows correlated with occupations are more critical for predicting the use of ATAs than occupation *per se*.

Organization size as Ln(FULLTIME) is positively associated with RITs, ATAs, and CIRs. Unfortunately, it is difficult to learn much from this result. Larger organizations are able to have these arrangements because size allows for lower cost and greater returns, as well as more room to experiment with a variety of plans. Larger organizations also might have RITs and ATAs because they provide visibility and legitimacy to external constituencies. RITs have been championed as part of employee financial and psychological "empowerment." ATAs have been championed as providing employees, especially women, with the flexibility they need for lifestyle and family matters.

A critical question that emerges from these findings concerns the conditions under which we would expect small firms to have RITs. It may be argued that employees in small firms already share risks without necessarily receiving contingent compensation, since pay is more variable for employees in small, as compared to large, organizations (Dunlop 1988). Whether employers in small firms exercise more or less hierarchical supervision remains open to question.

We can similarly ask about the conditions for which small firms have ATAs. Small firms may be less able to accommodate the use of ATAs because they create significant coordination and work-flow problems. However, there are undoubtedly many situations in which small firms can make use of these practices, especially for attracting or retaining a community-based or local workforce in a service-oriented business.

Organizational demographics lead to expected results. When there are more female employees, organizations make more use of ATAs—however, this relationship was only significant at the 10 percent level. When there is a greater number of older workers, organizations more frequently rely on the contracting-in of retirees. Both of these findings may be explained in terms of labor supply and allocative efficiency. Firms offer these arrangements to attract and/or retain labor. However, we cannot rule out distributional influence, especially with older workers and the use of CIRs. When there is a greater percentage of older workers in organizations, they seem to command a sizeable voice that influences the greater use of CIRs. Whether

these programs are beneficial to retirees *and* beneficial to their organizations remains an open question.

We did not hypothesize nor find distributional influence for minorities. However, we did hypothesize but did not find that percent minority in a workplace might be related to less use of RITs. The scaling of the variable, however, limits our analyses. Since the variable is scaled to a maximum category of 35 percent, its full range is never used, and it is impossible to specify its functional form as a quadratic or other nonlinear form. In a separate analysis not shown, we recoded the variable as a dummy variable by distinguishing between those organizations having less than or equal to 10 percent minority versus those with more than 10 percent minority. We found that RITs were used significantly less in organizations with a greater percentage of a minority workforce.

We caution that this result should be viewed as a lead rather than a finding. In addition to scaling problems, we only have partial controls for human capital differences and job differences. But, if found elsewhere, the result suggests that minorities have not been experiencing as much of the "empowerment" movement that founded RITs. If the source lies in human capital as opposed to race or national origin, these findings offer another reason for improving skills and training in the U.S. If the source lies in discrimination, then there is a very real need for diversity training programs and other efforts to promote understanding and acceptance of individuals of different races or countries of origin.

The results for these three demographic variables may pose potential tensions for organizations and their members. While ATAs, RITs, and CIRs have arisen in part to promote allocative efficiency and organizational capabilities, they may play into and reflect efforts by constituencies in organizations to have their demands accommodated, their discriminatory tastes played out, and their pockets deepened. If these latter uses weigh heavily, in the long run we would expect firms to either terminate these arrangements or, if they are costly to firms and they still persist, for firms to be terminated. In the short run, research will be needed to determine if these arrangements influence organizational performance positively or negatively.

RITs appear to be part of the implementation of a firm's business strategy. Firms use RITs to mobilize "core" employees to take more risks, manage themselves in a more supportive environment, and work in teams. These core or highly dedicated employees appear to be important in implementing a firm's business strategy when shifting its portfolio to focus on its distinctive competence or core capability.

To further pursue this result, we interacted the shift in the business portfolio with Ln(ENTRY) to further examine RITs. Recall that Ln(ENTRY) is largely a measure of growth. As shown in Table 4, when adding the interaction term to the equation, the significant main effect still holds for the shift in the portfolio. In addition, there is a significant negative interaction effect at the 10 percent level. As shown in Figure 1, the slope of Ln(ENTRY) on RITs is negative for firms that had shifted their business portfolio; the slope is positive but insignificant for those firms that had not shifted their portfolio. Thus, firms that shift their business strategy and grow actually make less use of RITs. These results further suggest that those firms shifting their portfolio and narrowing it toward a distinctive or core competence are the ones that make use of RITs.

In addition, we interacted shift in the portfolio with Ln(ENTRY) to further examine the contracting-in of retirees. As shown in Table 4, there are no main effects, but there is a significant negative interaction at the 10 percent level. As shown in Figure 2, contracting-in is used increasingly in those firms that did not shift their portfolio but that had new entry-level employees. Presumably, firms make use of retirees to train, to transmit more general firm-specific knowledge, and to supervise new employees. The slope for Ln(ENTRY) with those firms that had shifted their business portfolio is negative but insignificant.

The effects of technological change are quite strong for

ATAs and RITs. The variable, however, captures many different kinds of technological changes. Future research is needed to identify specific technological changes and determine if they inhibit or promote the use of ATAs, RITs, and CIRs.

ILM effects operate largely through training costs for new employees. When employers have higher training cost structures, they appear to want to protect and maintain their human capital investments. The use of the three HR arrangements therefore appears to be means for meeting allocative efficiency. The use of RITs may represent an effort to reap additional benefits from training costs. That is, rather than simply acting as a way to minimize costs, RITs may be an effort by firms to use training to develop new or improved organizational capabilities that add to revenues and generate rents.

Career ladder plans may be critical for the success of RITs. RITs would seem to require employees who have knowledge of the organization, and career ladders quite literally promote such knowledge. Yet, RITs may "sow the very seeds of destruction" for formal career ladders. If employees are placed in self-managed work groups, less hierarchy and, hence, less career ladders are needed. Ultimately, few vertical moves exist, and tournaments have many losers and only a few partial winners. The motivational value of tournaments may then be lost or may become negative as an increasingly larger segment of an organization's workforce are losers in the perceived equivalent of the first round.

Finally, our findings relate to a developing literature that takes a portfolio approach to human resources (Osterman 1987, 1988; Pfeffer and Baron 1988). The approach looks at the organization as the unit of analysis and addresses how organizations mix or substitute different human resource arrangements. Ostensibly, our results tie closely to the human resource (HR) portfolio that has received the most attention: the core-periphery human resource strategy (Abraham 1990; Belous 1989; Doeringer and Associates 1991; Osterman 1987, 1988; Pfeffer and Baron 1988).

The core strategy and RIT HR arrangements have several commonalities. Core employees have broad jobs and are rotated frequently (Osterman 1988). These two qualities taken together are tantamount to a team structure. Cores have employment continuity (Osterman 1988); our RITs have organizational support. Cores have contingent compensation (Osterman 1988); our RITs have incentives and gain sharing. Peripheries are a diffuse category said to represent part-timers, high- and low-skilled temporaries, and freelancers (Abraham 1990; Belous 1989; Magnum, Mayall, and Nelson 1985; Pfeffer and Baron 1988). Employees with ATAs and retirees who are in contracting arrangements would be placed in the periphery—however much of a procrustean bed the term is. The periphery is viewed as a way to minimize labor costs, broadly defined to include direct labor costs, labor flexibility (Osterman 1987), and reduced risk in implicit or explicit contracts (Kawasaki and McMillan 1987).

We believe, however, that equating our three HR arrangements with the core-periphery strategy understates important variation in HR portfolios and may underestimate the positive or revenue contributions of human resources in organizational performance. Peripheries can provide organizations with special expertise and critical knowledge from outside. Indeed, Abraham (1990) finds that contract workers may have special expertise that they bring to organizations; the retirees and some of the employees in altered-time arrangements in this study may have such a role at times as well. And, the results for RITs suggest that organizations harness and mobilize core human resources as part of a business strategy to develop organizational capabilities through distinctive and core competencies. Our work, therefore, suggests that a very important area for future study involves further identifying and testing the affirmative roles of human resources and different mixes of human resources in promoting organizational capabilities and competencies.

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